head impacted, delivered it by forceps; uterine wound closed by carbolized catgut sutures; little hemorrhage. Woman died in 62 hours. External wound healthy; cat-gut sutures all untied; about a half-pint of sero-sanguineous fluid in peritoneal cavity; no traces of peritonitis; abdominal organs generally healthy; clot in right ventricle of heart extending about half an inch into pulmonary artery, and continuous with clot in right auricle; lungs congested, masses of consolidation at apex of left, which was contracted to about a third of its normal size. Uterus showed no evidence of disease.

Dr. Routh, who performed the operation, attributed her death to septicæmia and heart-clot, the former originating in the failure of the ligatures, and consequent escape of uterine discharge into the abdominal cavity. He expressed the opinion that, with silk, or silver sutures, the patient might have been saved.

Dr. Meadows reported that in a case where he had used carbolized catgut sutures, the same giving way of the sutures, and consequently fatal result occurred. There is a decided difference of opinion as to the value of sutures in the uterus; but there is no question that in atony or inertia, the result of prolonged uterine action, the silver suture is all-important to the saving of life. Because women recover where no sutures have been used, is no argument against their being employed in many cases, especially where the uterine wound bleeds freely, the woman is exhausted, or the incision is not greatly reduced in length, and closely shut up by muscular contraction. By the use of six of these sutures, Dr. H. C. D'Aquin of New Orleans, in 1867 (see *N. O. Med. and Surg. Journ.*, July 1868), saved the life of a woman who had been in labour ten days, in whom the uterine wound bled freely, and the uterus failed to contract, so much so that its right side fell in. With a putrid fœtus in the uterus, a labour of ten days, pulse of 143, and respiration of 26, there was no hope without a close mechanical approximation of the uterine incision. Four years after the operation, there had been no inconvenience experienced from the sutures. The result in sutured cases in the United States, even after long labour has exhausted the woman, leads the reviewer to advocate the use of the silver wire cut closely, and bent down flat upon the uterine wall. A post-mortem examination, made long after such an operation, revealed no appearances of peritonitis. The wires were covered in with newly organized tissue, the result of inflammatory action around each suture; but other than this, there had been no peritoneal change. Linen sutures were used with success in one case after a labour of 62½ hours (*N. Y. Med. Record*, 1868). The usual gaped appearance of the uterine wound, and the presence of uterine discharges in the abdomen, found in post-mortem examinations after Cæsarean operations, satisfy us of the importance of using uterine sutures. R. P. H.

ART. XXIV.—*Seventh Annual Report of the State Board of Health of Massachusetts.* January, 1876. 8vo. pp. xxii., 551. Boston, 1876.

THE general Report of the Board refers with pardonable pride to some great sanitary reforms brought about through its labours. Through the success of its abattoir system, an entire suburban town has been transformed from a disgusting and unwholesome nuisance into a healthful and attractive place of residence. And an enormous pork-packing business of extreme importance to the commerce of the city has been so admirably regulated that there is no longer any shadow of a fear that sanitary considerations may require its destruction. These are indeed proud achievements.

It is a pleasing evidence of harmonious co-operation for the public good, that the State Board requests to be relieved from the further supervision of the Boston abattoirs, by the transference of these to the charge of the Municipal Board, now fully organized and efficient.

The appointment of a State Engineer, to advise the Legislature, and to provide for the towns which may consult him the necessary counsel and information as to water-supply, sewerage, etc., is a suggestion which seems to us a wise one. It would tend to secure harmony of action between different public undertakings and prevent one community from injuring another. The remuneration of such an officer is recommended to be made by the parties consulting him. Some other recommendations here made we will return to after noticing the special reports on which they rest.

The feature of this Report which overshadows all others, and gives it this year an especial value, is a special report or series of reports prepared in compliance with an Act of the General Court. This called for the full investigation of water-supply, drainage, sewerage, pollution of streams, utilization of sewage, etc., as affecting the health and prosperity of the State. The existing and increasing contamination of the waters of the State was the motive of the legislation.

Accordingly, as a foundation for subsequent labour, the Board caused to be made a most thorough examination of the most densely populated river-basins and principal water-sheds of the State. This work was entrusted to Mr. James P. Kirkwood, C. E., of Brooklyn, N. Y., a gentleman of unusual experience and knowledge of sanitary engineering. Careful surveys were made by himself and three assistants from which maps here printed were prepared, showing the limits of all the different water-sheds. Then in regard to five particular basins, the exact location, amount and character of pollutions entering the streams was determined with the greatest possible exactness, and here recorded in tables and indicated on separate maps. One important table, too, shows for each river, the area of its basin, its population, number of mills and of operatives, the daily flow of water, and other particulars, giving the like facts for several English rivers and river-basins as standards of comparison.

After some consideration of the evidence proving that polluted water injures health, and of the real or apparent contradictions to this general rule, Mr. Kirkwood proceeds to estimate the precise amount of each refuse product which results from a certain given production in different kinds of manufactures. Thus, the making of a thousand tons of wool into cloth necessitates the removal or the destructive use of so many tons of grease, so many of soda, so many of pig's dung, so many of urine, and so on. And so for every prominent manufacture, all chemicals and other agents used are enumerated, and the waste-products thence resulting are estimated with careful discrimination. We are assisted in forming some idea of the influence of contaminated water on health by experiments, here quoted, upon fish, with very dilute solutions of the principal acids and other chemicals discharged from factories.

Now follow series of tables, for each of the selected water-courses, showing number and kind of factories draining into it, with number of operatives, and all data necessary to the correct estimation of pollution. These same facts, together with drainage area, for numerous points higher up-river, or on its branches, are also exhibited in more condensed form. Analyses of water taken from all these same points, complete the tabular presentation of results. Suggestions for improvements, general observations on sanitary characteristics, and facts insusceptible of tabulation, are given in connection with each basin.

In some general conclusions, Mr. Kirkwood takes strong ground against polluted water. He fully agrees with the opinion of an English commission on rivers-pollution, that *water once contaminated with sewage can never after be trusted as perfectly safe for human consumption.* Sewage proper, often to a large amount, enters these same rivers which are recipients of factory waste.

How to protect and relieve the streams from this fearful influx of abominations, is the problem the solution of which is desired by the framers of the Act creating this investigation. It must be confessed that the difficulties of the question have not been very fully met, or rather, have not been conquered. Violent and revolutionary measures, if such were practicable, are not demanded as yet by any magnitude of recognized evil results. The central authority, if such be created, must point out in each particular case the means of cure, before it issues imperative commands. The neutralization or removal of harmful waste matters from fluid refuse, and the purification of sewage proper by irrigation, seem to be the directions in which the writer looks for relief.

The second portion of this special report is by Dr. Frederick Winsor, who considers "The Water-supply, Drainage, and Sewerage of the State, from the Sanitary Point of View." It aims especially to show by observation and by testimony, how and where, throughout the State, sewage is endangering health. Circular letters of inquiry addressed to correspondents of the Board received answers from 188 towns, and supplied much of the information here used. Before using the replies thus received, Dr. Winsor describes and illustrates some methods of removing excrement which have been more or less widely tried. He seems to favour a "pail-system" used with dry ashes.

The water-supply and system of sewerage of forty-six cities and towns having aqueducts is exhibited in a tabular form. The outlet or disposal of sewage is also shown. Of towns reporting no systematic carriage of sewage, 123 report from one-half to the whole of it as discharged into or upon the surface of the soil.

It should be noted that the medical correspondents who have answered the inquiries sent them are presumptively those whose opinions would possess the most value. And so generally do they represent the more populous districts that the communities for which they speak do actually contain 84 per cent. of the whole population of the State.

Nearly one half the answers mentioned offensive odours from sewage. Twenty-four observers connect the prevalence of definite disease with sewage. Several others suspect an evil influence on the health of their neighbourhood from this cause. Sixty-five, on the other hand, report bad odours without resulting disease.

The pollution of wells by sewage is reported by ninety correspondents, of whom sixty-three connect therewith definite production of illness. Of the latter, forty-four reports were of typhoid fever, often several cases to each foul well, as once for instance twenty cases.

Two lists are given of towns delivering sewage into streams and ponds. The first contains those instances in which the medical correspondent considers the results of this disposal as satisfactory, and the second, those deemed unsatisfactory in results. The latter category is slightly more numerous, and represents proportionately a much larger population. Dr. Winsor takes occasion to remark that the evils will naturally tend to increase; and that the most dangerous pollutions are undiscoverable by examination. The same degree of impurity, too, which may be borne by a strong man, may poison a feeble one; and even the former may succumb in time to an influence long resisted.

The question as to the effects of changing brooks into covered sewers, brings out some interesting information. Dr. Winsor is probably right in believing that the only safe course is to have two conduits, one perfectly tight for the sewage, and another but partly closed to carry off the natural moisture and drainage of the soil.

Of one hundred and twenty-eight towns reporting many damp cellars, ninety-seven find this condition productive of disease. Bronchial and pulmonary complaints, with rheumatism, particularly subacute, are oftenest mentioned.

Detailed reports are given from several correspondents. One concerning Boston contains a map showing present sewer outlets, and the grand and expensive system recently proposed to obviate the very grave and radical defects of the existing sewerage. Others are extremely instructive to the sanitary student, and full of warning to the people.

In a third part of this special report Secretary Folsom deals with the difficult subject of the "Disposal of Sewage." He has very recently visited Europe for the express purpose of qualifying himself for the intelligent treatment of this all-important matter.

After some general introductory matter Dr. Folsom passes to a brief examination of English legislation concerning sanitary matters, and a sketch of the history of systematic sewerage, as it arose in that country. He here finds striking examples, both of improved health and lessened death-rate among large bodies of people, through water-supply and sewerage, and of sickness and increased mortality sometimes caused by systems badly devised or imperfectly constructed.

The earth-closet and the ash-closet systems, we believe, are very fairly judged by the writer. While they can be so managed as to give immunity from the evils of open privies, and while of undoubted applicability in certain limited fields, they are yet wholly unadapted to the uses of large cities and of careless and ignorant people. In exceptional circumstances, these appliances are admirable; but as a method of solving the great problem now before us, they are utterly valueless.

Water-carriage is believed by Dr. Folsom to be, at present, the only practicable method of removing sewage from densely populated communities.

Considerable information is given us, as to the nature and working of the vacuum system of Capt. Liernur. Evidently Dr. Folsom does not regard this system as adapted to the wants of our large cities. We judge that, like the "earth-closet," it requires an impracticable degree of care, forbearance, and judgment; and besides, a very large original outlay. It should be remembered that the conditions of the sewerage problem in Holland—often actually below the sea-level—are wholly different from those of American cities. In cities below tide-water, the Liernur plan may be the only one practicable, and, therefore, desirable at any cost.

Many different plans for precipitating, purifying, and disinfecting sewage are described, and their practical working shown by the actual experience of English and continental towns. They have not proved economic successes, nor wholly satisfactory otherwise.

As to sewage irrigation, Dr. Folsom has brought together the results of a very large number of British and continental experiments, under very varied conditions. The teaching of these seems to be, that when adequately and intelligently planned and skilfully managed, sewage irrigation can be conducted without offence, without any danger to health, with the result of entire purification of the effluent water, and, to say the least, at an expense not inordinately great. Where the processes have failed to attain the full measure of success, the reason of failure has been shown, and the remedy suggested. We do not suppose it can be absolutely proved that the effluent water in the most successful cases is surely free from the germs of cholera or of typhoid, but it answers high tests of chemical purity, is drank by animals and men, is harmless to fish, and has retained its clearness and sweetness, when bottled, for a year.

Dairy-farming seems to be indicated as probably the most profitable kind, in using the sewage irrigation. Cattle are healthy, and the milk and its products are every way faultless. The direct produce of the soil is wholly free from any disagreeable or unwholesome quality. It will be remembered we are speaking of things as Dr. Folsom found them in the properly planned and well managed irrigation systems.

The extreme cold of our northern winters will doubtless somewhat interfere with this method of purifying sewage. Still, the experience of Dantzic, on the Baltic, with a climate very like that of Massachusetts, indicates that the evil is much less than would be expected. With a sufficiency of divided plots of land, to be ploughed in the spring, no great trouble need result from some surface accumulation during hard frost. Even at the temperature of zero, however, liquid sewage sinks into the ground.

It would have been interesting to know the exact financial results, in the best English experiments; but Dr. Folsom merely tells us that of forty-four English towns using sewage irrigation, not one recovers expenses. From our severer winters, and our more dilute sewage, he anticipates a still less favourable showing for American towns. But for our inland cities, remote from large rivers, something must be done, and that speedily, He justly says that we cannot wait for some great discovery to be made by the chemists, which shall cheaply cleanse our sewers from their perilous stuff. Hence, he counsels experiment upon this system, in the cases where relief is most urgently called for, and where the conditions seem most adapted to its success.

The concluding portion of this instructive report consists of a brief "Summary and Recommendations," signed by the entire Board, and by the gentlemen conducting the special inquiry. Much stress is laid upon the injury to health arising from dampness of soil, under and around the dwellings of the people. This is indicated by the great number of damp cellars, with consequent disease, so generally reported. Thorough drainage is insisted upon, as a duty of individuals and of towns. For isolated houses and small towns, the speediest and least offensive removal of filth and slops possible in the circumstances, to a distance and to cultivated ground, is urgently advised. Systematic water-supply should be at once accompanied by regular and well-built sewers. Legislation is counselled prohibiting any additional discharge of sewers into water-courses or ponds, without purification by irrigation. Other formal recommendations are made looking towards the practical application of the ideas embodied in different portions of the report.

The whole of this special report occupies two-thirds of the volume, is profusely illustrated with charts and plates, and forms perhaps the most important sanitary paper ever issued in this country. Dr. Folsom's contribution especially is of great value and interest.

To glance briefly at the usual sanitary essays and papers making up the general Report, we have two or three most curious and instructive instances, from the experience of Dr. H. I. Bowditch, of the terrible penalties sometimes exacted for the violation of sanitary laws in country houses.

Mr. Edw. S. Philbrick, Civil Engineer, has a paper upon "Defects in House Drainage, and their Remedies." While much attention is given to the special conditions of Massachusetts climate and customs, this essay might prove very valuable to any one wishing to build or alter a house intelligently. The ignorance, and the wilful unfaithfulness, of builders, plumbers, and other artificers, of which sad instances are here cited, render it indeed almost a necessity for every house-holder to know how work ought to be done, and then see it so performed. Could not the Board do much good by printing large editions of single papers like this, and that of Dr. Bowditch, and some others, for popular circulation at a low price?

Dr. A. H. Nichols describes a serious outbreak of intestinal disease among boarders at a summer hotel, from the use of very foul ice.

Dr. F. W. Draper reports the commencement in Massachusetts of a movement which is to become of incalculable importance to the public weal. Registration, not of deaths but of diseases prevalent, has there for the first time been attempted. A large number of the best known and employed physicians throughout the State consented to make a weekly report, in an extremely simple form, of the maladies most common, with a mark to indicate general character as mild or severe. Even as exhibited by the first short experience of 1875, the results are very curious and instructive, and have "surpassed the expectations of many who were interested in its trial."

The usual report upon the "Health of Towns" and two or three from particular towns, contain matter of considerable interest, especially as concerning diphtheria. Dampness and filth, together, seem to have been powerful predisposing causes of the disease. Once started, contagion and infection have aided its increase.

The pressing need for Boards of Health, other than the civil authorities acting as such, is emphatically stated, for every town in the Commonwealth.

B. L. R.

Art. XXV.—*Statistics, Medical and Anthropological, of the Provost-Marshal-General's Bureau, derived from Records of the Examination, for Military Service in the Armies of the United States during the late War of the Rebellion, of over a million Recruits, Drafted Men, Substitutes, and Enrolled Men.* Compiled under direction of the Secretary of War. By J. H. Baxter, A.M., M.D., Colonel and Chief Medical Purveyor United States Army, late Chief Medical Officer of the Provost-Marshal-General's Bureau. In two volumes, 4to. pp. lxxxvii., 568, and xxviii., 767. Washington: Government Printing Office, 1875.

This work is a magnificent contribution to our exact knowledge of man. Founded on carefully recorded examinations made by scientific observers, grouped and analyzed with admirable skill, it adds another notable example of the beneficent results which often flow from great calamities. Taken with other Governmental medical publications, it well justifies the wise and witty reference, by a recent writer in this Journal, to the famous riddle propounded by Samson to the Philistines. And surely neither biblical nor heathen athlete ever attempted a more tremendous labour than must have been here encountered in assorting and arranging the collected matter in such manner as to exhibit the millions of facts in all their different aspects and in forms available for use.

The introductory chapter of the first volume sets forth the plan and scope